**In the claims**

**Cancel claims 1-43.**

**Claims 44-53 remain in the application.**

**44.** A method of making a magnetic head assembly having a read head and a write head comprising the steps of:

a forming of the write head comprising the steps of:

forming ferromagnetic first and second pole piece layers with a yoke portion between a pole tip portion and a back gap portion;

forming a nonmagnetic write gap layer between the pole tip portions of the first and second pole piece layers;

forming an insulation stack with at least one coil layer embedded therein in the yoke portions of the first and second pole piece layers; and

connecting the first and second pole piece layers at their back gaps portions;

a forming of the read head comprising the steps of:

forming nonmagnetic nonconductive first and second read gap layers;

forming a dual spin valve sensor between the first and second read gap layers;

forming a ferromagnetic first shield layer; and

forming the first and second read gap layers between the first shield layer and the first pole piece layer;

a making of the dual spin valve sensor comprising the steps of:

forming first and second pinned layer structures wherein each pinned layer structure has a magnetic moment;

forming antiferromagnetic first and second pinning layers exchange coupled to the first and second pinned layer structures for pinning the magnetic moment of the first and second pinned layers respectively;

forming an antiparallel (AP) coupled free layer structure between the first and second pinned layer structures with a magnetic moment; and

forming a nonmagnetic conductive first spacer layer between the first pinned layer structure and the AP coupled free layer structure and a nonmagnetic conductive second spacer layer between the second pinned layer structure and the AP coupled free layer structure; and

a making of the AP coupled free layer structure including the steps of:

forming ferromagnetic first, second and third antiparallel (AP) coupled free layers; and

forming a first antiparallel (AP) coupling layer between the first and second AP coupled free layers and a second antiparallel (AP) coupling layer between the second and third AP free layers.

**45.** A method as claimed in claim 44 further comprising the steps of:

forming a ferromagnetic second shield layer between the second read gap layer and the first pole piece layer; and

forming a nonmagnetic separation layer between the second shield layer the first pole piece layer.

**46.** A method as claimed in claim 44 as claimed in claim wherein the first and third AP coupled free layers are formed of a cobalt based material and the second AP coupled free layer is formed of a nickel iron based material.

**47.** A method as claimed in claim 46 wherein the second AP coupled free layer is formed with a magnetic thickness that is greater than a net magnetic thickness of the first and third AP coupled free layers.

**48.** A method as claimed in claim 47 wherein the magnetic thicknesses of the first and third AP coupled free layers are equal.

**49.** A method as claimed in claim 48 wherein the materials of the first and second pinning layers are the same.

**50.** A method as claimed in claim 49 wherein the first pinned layer structure is a double antiparallel (AP) pinned layer structure that is formed comprising the steps of:

forming ferromagnetic first and second antiparallel (AP) coupled pinned layers; and

forming an antiparallel (AP) coupling layer between and interfacing the first and second AP pinned layers.

**51.** A method as claimed in claim 50 wherein the second pinned layer is a triple antiparallel (AP) pinned layer structure that is made comprising the steps of:

forming ferromagnetic first, second and third antiparallel (AP) coupled pinned layers; and

forming a nonmagnetic first antiparallel (AP) coupling layer between and interfacing the first and second AP pinned layers and forming a nonmagnetic second antiparallel (AP) coupling layer between and interfacing the second and third AP pinned layers.

**52.** A method as claimed in claim 51 wherein the double AP pinned layer structure is formed with a net magnetic moment that is equal to a net magnetic moment of the triple AP pinned layer structure.

**53.** A method as claimed in claim 52 wherein:

each of the double and the triple AP pinned layer structures is formed with a ferromagnetic coupling field with respect to the free layer structure; and

the ferromagnetic coupling fields of the double and the triple AP pinned layer structures are equal.